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Assistant Commissioner for Patents  
Washington, D.C. 20231

Attorney's Docket No.: SA9-98-050

FILING TRANSMITTAL

Transmitted herewith for filing is the Patent Application of: Chin et al.

For: **WEB BASED USER INTERFACE CONSTRUCTION METHOD**

ENCLOSURES

- ☒ 17 page application including specification, claims and abstract;
  - ☒ 3 sheets of informal/formal drawings;
  - ☒ a Declaration, Power of Attorney & Petition (signed);
  - ☒ a postcard for return to us as proof of receipt of the above documents.
- and
- ☒ an Assignment of the invention with an assignment cover sheet;
  - ☐ Verified Statement Claiming Small Entity Status (37 CFR 1.9(f) and 1.27(b))
  - ☒ IDS (form PTO-1449) and copies of references;
  - ☐ an associate power of attorney;
  - ☐ a certified copy of the priority document (Under 35 USC 119) is enclosed
  - ☐ Other

TYPE OF FILING

- ☐ This application claims the benefit of an earlier filed U.S. Patent Application (35 USC 120).
- ☐ This application claims the benefit of the priority date of an earlier filed \_\_\_\_\_ application (35 USC 119).
- ☐ This is an application filed pursuant to 37 CFR 1.53, permitting receipt of a filing date upon filing of specification, claims and drawings, if required, with applicant being given a period of one month from the date of notice to file the fee and oath or declaration.
- ☒ In the event any parts of this application are missing, please treat this as a filing under 37 CFR 1.53 as defined just above.

CERTIFICATE OF MAILING (37 CFR 1.10(a))

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Date: September 25, 1998

*Patricia Beilmann*

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The filing fee has been calculated as shown below:

			SMALL ENTITY	OR	OTHER THAN A SMALL ENTITY
BASIC FEE Design Patent			\$165	\$	\$330
BASIC FEE Utility Patent			\$395	\$	\$790
EXTRA FEES			RATE	FEE	RATE
Total claims	24	minus 20 = 4	x11 =	\$	x22 = \$88
Independent Claims	4	minus 3 = 1	x41 =	\$	x82 = \$82
<input type="checkbox"/> Multiple Dep. Claim			+135 =	\$	+270 = \$
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Dated: September 25, 1998

Respectfully submitted,

  
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# **WEB BASED USER INTERFACE CONSTRUCTION METHOD**

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## **TECHNICAL FIELD**

10 The present invention relates to the field of computer data communications and more  
specifically to a method and system for providing World Wide Web user interface pages which  
are adapted for particular audiences. The predominant current usage of the present inventive web  
based user interface (“WUI”) construction method is in providing web pages for the World Wide  
15 Web, wherein the ability to provide particular languages, dialects, currencies, and the like, all  
adapted for a particular audience, is desired.

## **BACKGROUND ART**

Internationalization is the process of enabling a program to run internationally. That is,  
20 an internationalized program has the flexibility to run correctly in any country. Once a program  
has been internationalized, enabling it to run in a particular country and/or language is merely a  
matter of “localizing” it for that country and language, or locale.

One task in the process of internationalization is the translating of a program's user-visible interface into a local language. However, this is by no means the only operation required. Other concerns include displaying dates and times in the customary format for the locale, displaying number and currency values in the customary format for the locale, and sorting strings in the customary order for the locale.

Underlying all these localization issues is the even more fundamental issue of character encoding. Almost every useful program must perform input and output of text and, therefore, it is necessary to be able to adapt to local characterization standards.

Web-based user interfaces (hereinafter referred to as "WUI") are often implemented in both HTML and JAVA. Each display consists of one or more components (i.e. HTML page/frame(s) and/or JAVA applet panel(s)). Translation in a WUI is complicated by the fact that these components are built at different times (i.e. HTML pages/frames are built by an application running on the web server prior to down-loading, while applet panels are constructed by Java code as it executes in memory on the end user's local machine.)

In summary, in order to be adaptable for distribution to international markets, a web page must be flexible enough to display messages (or any other type of user-visible text, such as labels on GUI buttons) to the user in an appropriate language and format for the current locale. Typically, this means that the program should not use hard-coded messages and must instead read in a set of messages at run time, based on the local setting. Java provides a way to do this for Java applets. In Java, messages are defined as key/value pairs in a "ResourceBundle" subclass. Then, a subclass of ResourceBundle is created for each language or locale that the application is intended to support, naming each class following a convention that includes the

local name. At run-time, a ResourceBundle.getBundle() method is used to load the appropriate ResourceBundle class for the current locale. The ResourceBundle contains the messages which the application uses, each associated with a key which serves as the message name. Using this technique, the application can look up a locale dependent message translation based on a locale independent message name.

The above brief description of the problems associated with internationalization discloses that Java has provided some solutions for use within Java applets. However, to the inventor's knowledge, no corresponding solution exists for the HTML ("hyper-text markup language) encoded portions of an interface, which constitute the great majority of the most such user interfaces. To date, it has been required to provide a different HTML code for each language or variation of a user interface for which a target audience is desired.

### **DISCLOSURE OF INVENTION**

Accordingly, it is an object of the present invention to provide a web based user interface which is readily adaptable to varying languages and/or target audiences.

It is still another object of the present invention to provide a web based user interface which will require only limited bandwidth to attain acceptable transfer speed.

It is yet another object of the present invention to provide a web based user interface which will not require modifications to browser software to obtain a multi-language capability.

It is still another object of the present invention to provide a method for creating a web based user interface which will provide an output adapted for a particular language and/or target audience.

Briefly, the preferred embodiment of the present invention is a system for storing and communicating data which extends the internationalization capabilities built into the Java language, and further greatly improves the internationalization of web based user interfaces by providing key variables and corresponding values. The values are provided or created in the server in a plurality of HTML ResourceBundle classes (similar to the known Java ResourceBundle classes in structure, but differing in content as will be described in more detail hereinafter) such that there is an HTML ResourceBundle for each language or other such variable in which it is desired to communicate the user interface.

When a browser has requested a user interface page and provided information to the server regarding the language desired, the server builds the HTML code to send using the HTML code with embedded keys and the values from the appropriate HTML ResourceBundle. Java applets within the HTML encoded interface are also sent, along with a JAR file containing Java ResourceBundle(s) for each potential language. At the browser, the applets are constructed using the appropriate Java ResourceBundle from the JAR file.

An advantage of the present invention is that it is easier to internationalize web based user interfaces.

A further advantage of the present invention is that internationalized web pages are more compactly stored on a server.

Yet another advantage of the present invention is that web pages can be internationalized without increasing the amount of data which must be transmitted to a browser.

These and other objects and advantages of the present invention will become clear to those skilled in the art in view of the description of the best presently known mode of carrying

out the invention and the industrial applicability of the preferred embodiment as described herein and as illustrated in the several figures of the drawing.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

Fig. 1 is a flow diagram showing an example of the inventive web based user interface construction method;

Fig. 2 is a block diagram showing relevant portions of the content of a server and browser connected over the internet; and

Fig. 3 is a graphical representation of a typical web based user interface.

### **BEST MODE FOR CARRYING OUT INVENTION**

The best presently known mode for carrying out the invention is a user interface construction method which includes the capabilities required for internationalization. The inventive user interface construction method is depicted in a flow diagram in Fig. 1 and is designated therein by the general reference character 10.

Fig. 2 is a block diagram showing relevant portions of the content of a server 12 and browser 14 connected over the internet 16, and Fig. 3 is a graphical representation of a typical web based user interface 18 such as will be displayed by the browser 14. It should be noted that, herein, the server 12 indicates a combination of a computer and software running thereon, and the browser 14 likewise indicates a combination of a computer and software running thereon. The web based user interface 18 of Fig. 3 will typically be displayed on a display screen 20 associated with the browser (Fig. 2).

In the view of Fig. 2, it can be seen that, according to the present invention, the server has an HTML template 22 and a plurality (in this example, only two are shown for the sake of simplicity) of HTML ResourceBundles 24 (designated as 24a and 24b, herein). As will be discussed in more detail hereinafter, the term "HTML ResourceBundle" will be defined herein as being a file or files having the content according the present invention as described herein. It should be noted that, in the example presented herein, the file structure of the HTML ResourceBundles 24 is not different from that of conventional Java ResourceBundles, and so in this example the difference between the HTML ResourceBundles 24 and conventional Java ResourceBundles is in content only. However, it is within the scope of the invention that different file structures could be adapted for containing the information discussed herein as being included within the HTML ResourceBundles 24.

Typically, within the HTML template will be one or more (only one is shown in this example) of Java code 25 segments. In order to avoid unduly complicating the drawing of Fig. 2, the Java code 25 is represented therein in block diagrammatic form by the word "JAVA" enclosed in a block within the HTML code.

A JAR file 26 is a well known type of file construction which is associated with Java applications. The JAR file 26 is a compressed file which, according to the present invention will contain a plurality (two, in the present example) of Java ResourceBundles.

Accordingly, referring again to the flow chart of Fig. 1 in conjunction with Fig. 2, according to the inventive user interface construction method 10, in a series of preliminary operations 30 (prior to communication between the server 12 and the browser 14) the HTML template 22 is stored in the server 12 in a provide HTML template operation 32. Similarly, The



HTML ResourceBundles 24 are stored in the server 12 in a provide HTML ResourceBundles operation 34, and the JAR file 28 containing the Java ResourceBundles 28 is stored (or created) in the server 12 in a provide Java ResourceBundles operation 36.

Now turning to a discussion of run-time operations 38 as depicted in the flow chart of Fig. 1, at run-time the browser 14 will query the server 12 over the internet 16 in the conventional manner. This is indicated by a browser queries server operation 40 in the flow chart of Fig. 1. In a send language code operation 42 a language code 44 (depicted in box diagrammatic form in the example of Fig. 2) is sent from the browser 14 to the server 12. While some browsers have the capability of automatically sending the language code 44 when querying the server 12, it is within the scope of the invention that additional steps might be included such that the server 12 could request more information from the browser 14, perhaps even including user input at the browser 14, which would generate the language code 44 to be sent to the server 12. For example, where there might be other alternatives involved besides language – such as longer or shorter versions of the textual descriptions to be displayed in the user interface 18 – it is within the scope of the invention that a selected language code 44 be sent from the browser 14 to the server 12 to accommodate such a choice by the selection of a particular HTML ResourceBundle 24. Typically, however, on a sign on page there will be a choice box to indicate what language is wanted. For the purpose of this example and the corresponding illustrations, we will hereinafter assume that a user selects the HTML ResourceBundle 24a, which will contain text in US English format.

Continuing with the run-time operations 38, the server 12 will then construct and send a constructed HTML code 46 to the browser 14, using the selected HTML ResourceBundle 24, in

operations respectively designated in Fig. 1 as a construct HTML code operation 48 and a send HTML code operation 50. The appropriate JAR file 26 is likewise sent from the server 12 to the browser 14 in a send JAR file operation 52. It should be noted that, although the inventors have found it presently most economical to send the entire JAR file 26 containing all of the Java ResourceBundles 28 corresponding to a particular page of the WUI, it is within the scope of the invention that only selected Java ResourceBundles 28 be sent, as determined by the language code 44.

In the construct HTML code operation 48, a replacement variable 51 within the HTML template 22 is replaced with the corresponding content of the selected HTML ResourceBundle 24. The replacement variable 51 is set within HTML command delineators (“<” and “>”) and is identified by being further set within pound signs (“#”). Within the selected HTML ResourceBundle 24, the appropriate corresponding text is identified as follows: Data members within the ResourceBundle 24 are separated and identified by being set within curly brackets (“{” and “}”), within the curly brackets, the key replacement variable 51 corresponds to that within the HTML template 22. Following the key replacement variable 51 is a comma (“,”) and the comma is followed by the text or other item which is to replace the replacement variable. It should be noted that the replacement content of the HTML ResourceBundle can include text, HTML instructions, drawing files, or any other content which will be recognized by the browser 14 as HTML content in order to construction the WUI.

Referring now again to Fig. 3, the example of the typical web based user interface shown has a title frame 54, a navigation frame 56 and a work frame 58. Within any of these, but particularly in the work frame 58 might optionally be one or more (one is shown in the example

of Fig. 3) of Java applet(s) 60, and the Java applet(s) will often contain one or more (one is shown in the example of Fig. 3) of buttons 62, or such like features as are known to those skilled in the art to be included in Java applet(s) 60. The Java applet 60 is constructed by the browser 14 machine at run time using the appropriate Java ResourceBundle 28 from the JAR file 26 as dictated by the language of choice of the browser 14. This operation is indicated in the flow diagram of Fig. 1 by a build Java applets operation 62. In the conventional manner, the Java applet 60 can react dynamically with the user within the browser 14 such that communication between the server 12 and the browser 14 is minimized.

One skilled in the art will recognize that the example coding depicted in Fig. 2 will produce, according to the present invention, the work frame 58 of Fig. 3.

It should be remembered that the example being illustrated is for a single "page" of a user interface. It is contemplated by the inventors that the present invention might include many iterations of the HTML template 22 and related aspects to provide for the availability of a plurality of different pages of the web based user interface 18. Similarly, it should be remembered that, although the simple example described herein has only two of the HTML ResourceBundles 24, in most applications there will be a greater plurality of HTML ResourceBundles and a matching plurality of the Java ResourceBundles 28, to accommodate a greater plurality of language choices, or other such alternative presentations as may be desired.

## **INDUSTRIAL APPLICABILITY**

The inventive user interface construction method 10 is intended to be widely used for producing web based user interfaces which are readily adaptable for presentation in a variety of languages, or in any other alternative formats as may be desired.

5 It is anticipated that, as the present inventive method becomes popular, web page construction engines will be adapted to automatically insert keys and to construct associated HTML ResourceBundles.

As previously stated herein, both the server 12 and the browser 14 will generally be embodied as computers connected to the internet 16. The HTML Template 22, the HTML ResourceBundles 24, and the Java ResourceBundles 26 may each be embodied in essentially  
10 any computer readable medium such the operations 32, 34 and 36 of the flow diagram of Fig. 1 may each and all be accomplished by transferring the respective data from the computer readable medium to the server 12 computer. Similarly, the operations described herein in relation to the flow diagram of Fig. 1 may be physically embodied in computer readable program code which  
15 may also be stored on a computer readable medium and transferred therefrom to the server 12 or any such computer.

All of the above are only some of the examples of available embodiments of the present invention. Those skilled in the art will readily observe that numerous other modifications and alterations may be made without departing from the spirit and scope of the invention.  
20 Accordingly, the above disclosure is not intended as limiting and the appended claims are to be interpreted as encompassing the entire scope of the invention.

Since the user interface construction method 10 of the present invention may be readily produced and integrated into existing web servers and web based user interface construction systems and devices, and since the advantages as described herein are provided, it is expected that it will be readily accepted in the industry. For these and other reasons, it is expected that the utility and industrial applicability of the invention will be both significant in scope and long lasting in duration.

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**IN THE CLAIMS:**

1 1. A user interface, comprising:

2 an HTML encoded template having a replacement variable within; and

3 a resource file containing data for replacing said replacement variable.

1 2. The user interface of claim 1, and further including:

2 a plurality of said resource files such that said replacement variable is selectively  
3 replaced by data from a selected one of said resource files.

1 3. The user interface of claim 2, wherein:

2 each of the plurality of said resource files contains text in a different language such that  
3 said replacement variable will be replace with text in a language governed by the selection of the  
4 selected one of said resource files.

1 4. The user interface of claim 2, wherein:

2 a particular one of the plurality of said resource files is selected according to a language  
3 code.

1 5. The user interface of claim 1, wherein:

2 said resource file is an HTML ResourceBundle.

1 6. The user interface of claim 5, wherein:

said HTML ResourceBundle is alike in format to a conventional Java ResourceBundle.

7. The user interface of claim 1, wherein:

a constructed HTML code is built at a server by combining said HTML encoded template and data from said resource file.

8. The user interface of claim 7, wherein:

the server builds the constructed HTML code by substituting said replacement variable with data from said resource file.

9. The user interface of claim 1, and further including:

Java code within said HTML template; and  
a JAR file containing a Java ResourceBundle.

10. The user interface of claim 1, and further including:

a plurality of said resource files such that said replacement variable is selectively replaced by data from a selected one of said resource files to produce a constructed HTML code page;

Java code within said HTML template; and  
a JAR file containing a Java ResourceBundle; wherein  
the constructed HTML code page and the JAR file are transmitted to a browser.

1 11. A method for constructing a web based user interface, comprising:  
2 providing an HTML template to a server, said HTML template including at least one  
3 variable;  
4 providing a plurality of data files to the server, each of said plurality of data files having  
5 therein a data portion corresponding to said variable;  
6 selecting one of said plurality of data files; and  
7 constructing an HTML encoded user interface file by substituting the data portion from  
8 the selected one of said plurality of data files into said HTML template to replace said variable.

1 12. The method of claim 11, wherein:  
2 said HTML template includes Java code; and  
3 a plurality of Java ResourceBundles are provided such that when said Java code executes  
4 then data from a selected one of said Java ResourceBundles is provided in a Java Applet in the  
5 web based user interface.

1 13. The method of claim 12, wherein:  
2 the plurality of Java ResourceBundles are combined into a JAR file and transmitted from  
3 the server to a browser along with said HTML encoded interface.

1 14. The method of claim 11, wherein:  
2 a language code is sent from a browser to the server; and  
3 the one of said plurality of data files is selected according to the language code.



1 15. The method of claim 14, wherein:  
2 the language code is selected to indicate a particular language such that the one of said  
3 plurality of data files is selected according to the language desired.

1 16. The method of claim 11, wherein:  
2 each of the plurality of data files is in the form of a ResourceBundle.

1 17. The method of claim 11, wherein:  
2 each of the plurality of data files contains data in a different language or dialect.

1 18. The method of claim 11, wherein:  
2 each of the plurality of data files contains data arranged in key/value combinations such  
3 that the key is identical to said variable and the value is the data to be substituted for the variable.

1 19. The method of claim 18, wherein:  
2 the key/value pair is delineated by curly brackets; and  
3 the key is separated from the value by a comma.

1 20. The method of claim 11, wherein:  
2 said variable is delineated within said HTML template by pound signs.

1 21. A computer program product comprising a computer usable medium having a computer  
2 readable code embodied thereon configured to operate on a computer, comprising:

3 an HTML template having variables therein; and

4 a plurality of HTML ResourceBundles.

1 22. The computer program product of claim 21, wherein:

2 said HTML ResourceBundles each contain alternative data to be selectively substituted  
3 for said variables.

1 23. A computer program product comprising a computer usable medium having a computer  
2 readable program code embodied thereon configured to operate on a computer, comprising:

3 code to cause the computer to construct an HTML encoded user interface by substituting  
4 selected data to replace variables in an HTML template.

1 24. The computer program product of claim 23, and further including:

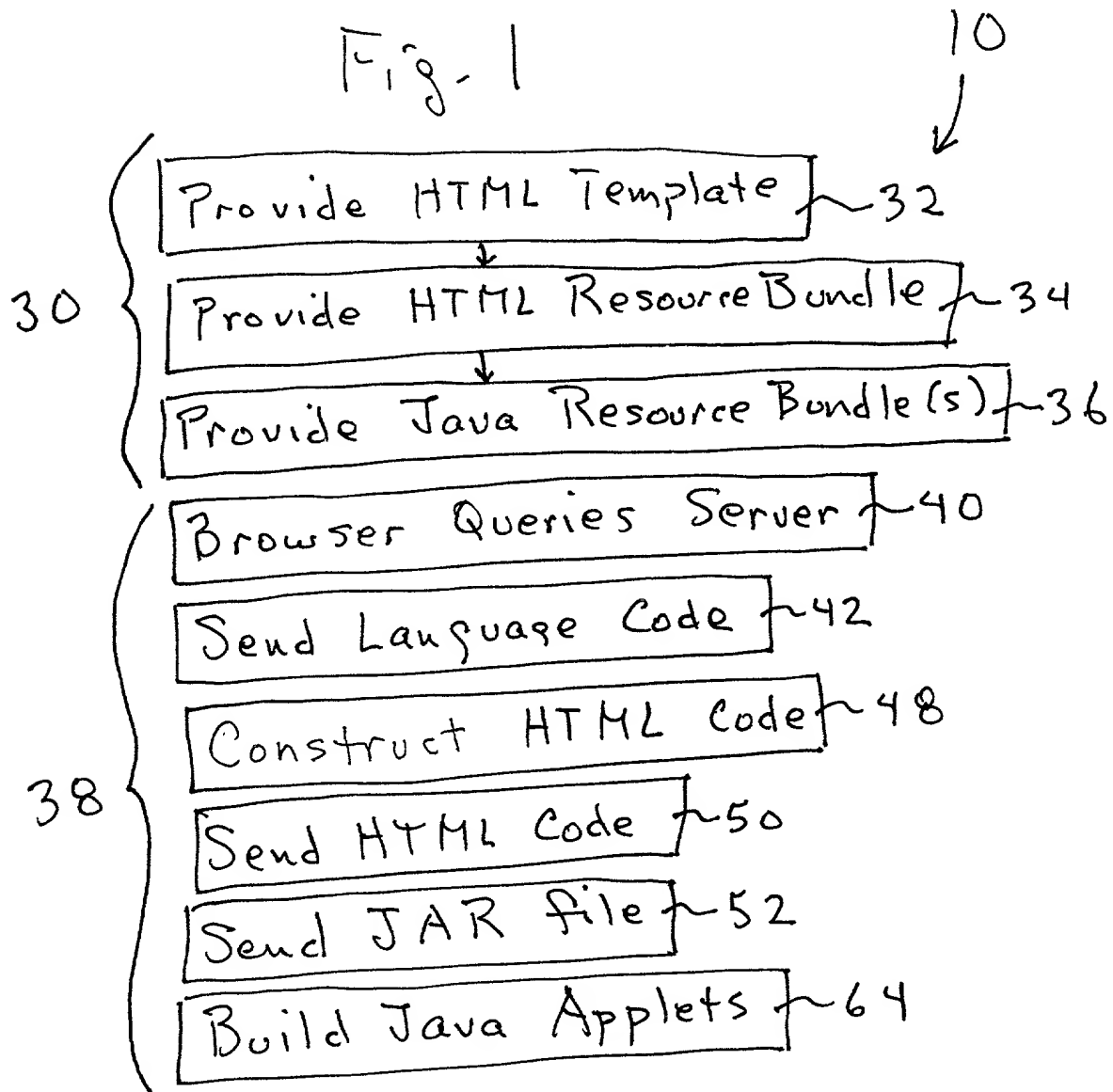
2 code to cause the computer to send the HTML encoded user interface to a browser.

## ABSTRACT

### **WEB BASED USER INTERFACE CONSTRUCTION METHOD**

A user interface construction method (10) for a web based user interface ("WUI") 18. A server 12 has an HTML template 22, HTML ResourceBundles 24, and JAR files 26 containing Java ResourceBundles 28. At run-time, a user will select a language at the browser 24 and a language code 44 will be transmitted to the server 12, whereupon the server 12 will construct a constructed HTML code 46 from the HTML template 22 and a corresponding HTML ResourceBundle 24. The constructed HTML code 46 (including Java code 25 inserts) will then be transmitted to the browser 14 along with the JAR file containing the Java ResourceBundles 28.

Fig. 1



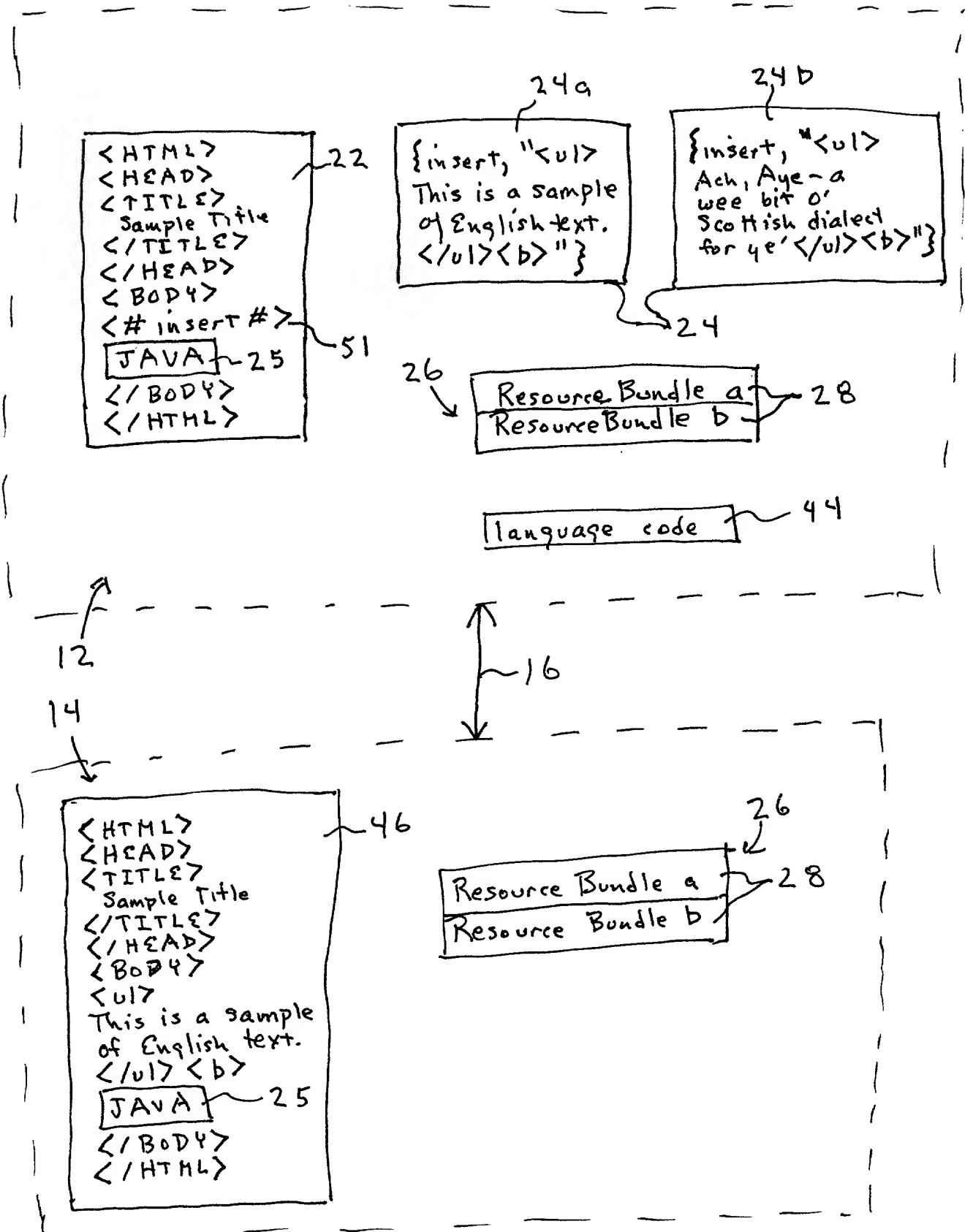
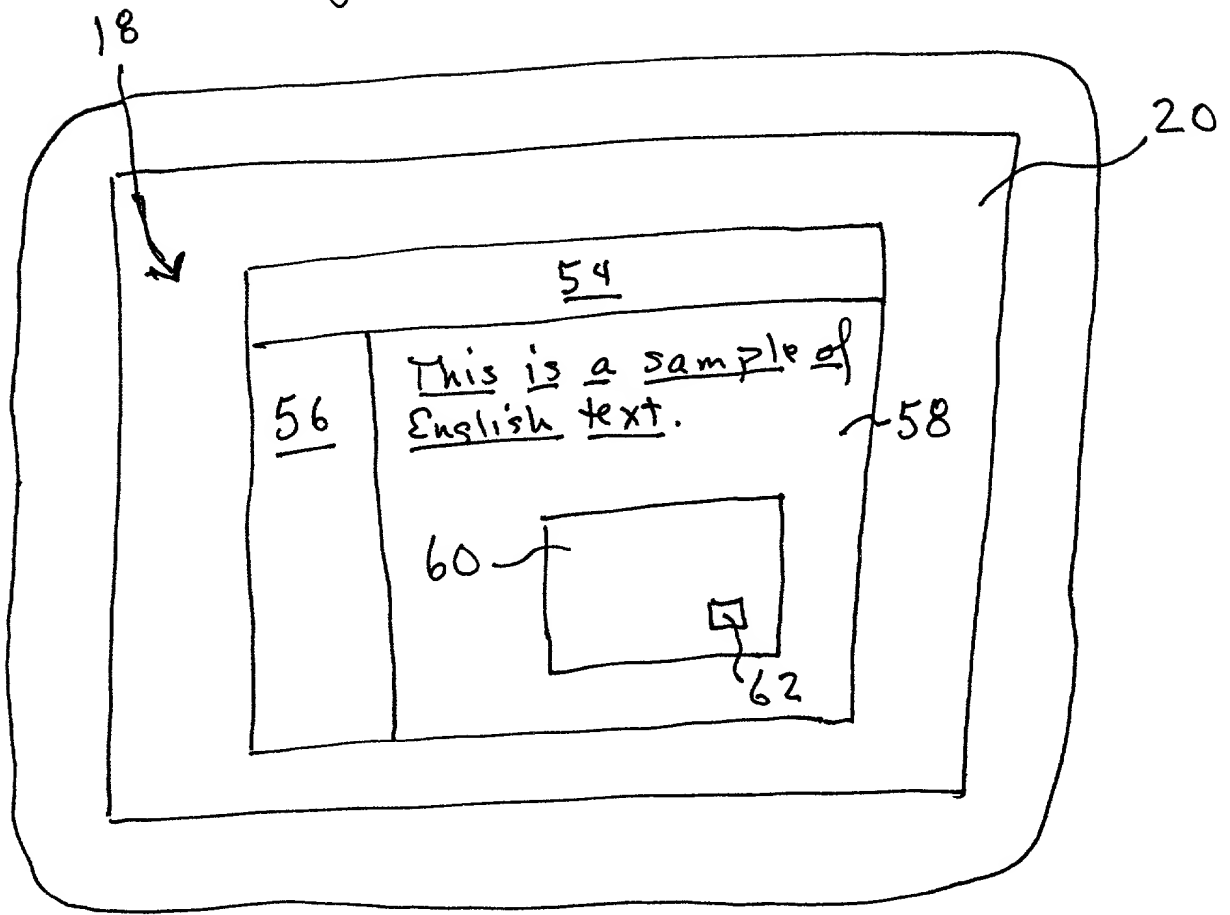


Fig. 2

Fig. 3



**DECLARATION, POWER OF ATTORNEY AND PETITION**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **Web Based User Interface Construction Method** the specification of which

(check one) ☒ is attached hereto.  
☐ was filed on \_\_\_\_\_ as Application Serial No. \_\_\_\_\_  
 and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application of which priority is claimed.

**Prior Foreign Application(s)**

			Priority Claimed	
(Number)	(Country)	(Day, month, year filed)	Yes	No
(Number)	(Country)	(Day, month, year filed)	Yes	No
(Number)	(Country)	(Day, month, year filed)	Yes	No

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

(Application Serial No.)	Filing Date	(Status: Patented, pending, abandoned)
(Application Serial No )	Filing Date	(Status: Patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

And I hereby appoint W. POMS, Reg. 18,782; G.P. SMITH, Reg. 20,142; G.E. LANDE, Reg. 22,222; A.C. ROSE, Reg. 17,047; L.J. BOVASSO, Reg. 24,075; D.J. OLDENKAMP, Reg. 29,421; C. DARROW, Reg. 30,166; M.E. HARRIS, Reg. 26,690; K.A. MACLEAN, Reg. 31,118; C. ROSENBERG, Reg. 31,464; M.E. BROWN, Reg. 28,590; E.F. O'CONNOR, Reg. 25,903; R.F. CARR, Reg. 17,110; A. ROTHENBERG, Reg. 17,843; R.L. GAUSEWITZ, Reg. 16,960; M.A. KONDZELLA, Reg. 18,013; A.P. BLOCK, Reg. 35,450; S.R. HANSEN, Reg. 38,486; D.N. LARSON, Reg. 29,401; J.W. INSKEEP, Reg. 33,910; G F COTTERELL, Reg. 37,802; H.D. JASTRAM, Reg. 19,777; J.M. KALIS, Reg. 37,650; C.J.

LERVICK, Reg. 35,244; C.A.S. HAMRICK, Reg. 22,586; R.O. GUILLOT, Reg. 28,852; E.C. CHANG, Reg. 37,593; J.D. VOELZKE, Reg. 37,957; G.L. FOUNTAIN, Reg. 36,374; J. BOYCE, Reg. 40,920; C. CHOU, Reg. P-41,672; L. HENNEMAN, Reg. 41,063; P.R. WADSWORTH, Reg. 29,219; M.D. LEE, Reg. 40,696; G.M. KNIGHT, Reg. No. 33,409; P. SABER, Reg. 37,494; C.A. HUGHES, Reg. 26,914; J.E. HOEL, Reg. 26,279; R.B. MARTIN, Reg. 26,945; L.G. MURRAY, Reg. 31,183; E.E. KLEIN, Reg. 34,337; D.R. MILLETT, Reg. 31,784; N.A. KRALL, Reg. 39,734; E.A. PENNINGTON, Reg. 32,588; J.C. REDMOND, JR., Reg. 18,753 as my attorneys with full power of substitution and revocation, to prosecute said application and to transact in connection therewith all business in the Patent and Trademark Office and before competent International Authorities.

Address all telephone calls to Robert O. Guillot at (408) 795-3000, and address all correspondence to:

Robert O. Guillot, Esq.  
**OPPENHEIMER WOLFF & DONNELLY LLP**  
 10 Almaden Boulevard, Suite 600  
 San Jose, CA 95113

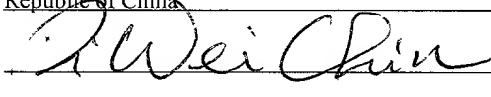
Wherefore I pray that Letters Patent be granted to me for the invention or discovery described and claimed in the foregoing specification and claims, and I hereby subscribe my name to the foregoing specification and claims, declaration, power of attorney, and this petition.

Full Name of Sole or First Inventor: Pi-Wei Chin

Home Address: 3139 Kermath Drive, San Jose, CA 95132

Post Office Address: Same as above

Citizenship: Republic of China

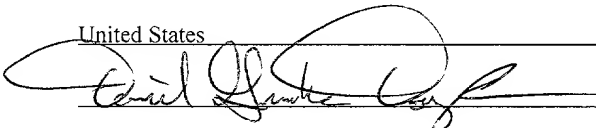
Inventor's Signature:  Date: 9/24/98

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Post Office Address: Same as above

Citizenship: United States

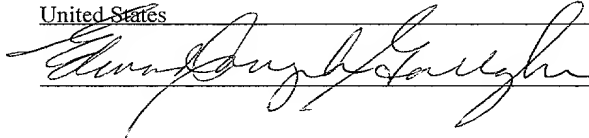
Inventor's Signature:  Date: 8/26/98

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Inventor's Signature: *Benjamin Franklin Yee* Date: 8-26-98